920569-905833 **MAIL STOP AF**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE THE APPLICATION OF	
Kermarec, et al.	Examiner: Joseph E. Avellino
SERIAL NO.: 10/054,207	Group Art Unit: 2143
FILED: January 22, 2002	Customer Number: 23644
FOR: Methods of Establishing Virtual Circuits and of Providing a Virtual Private Network Service Through a Shared Network and Provider Edge Device for Such	Confirmation No. 4665

BRIEF ON APPEAL

Honorable Director of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This appeal is with respect to the Examiner's final Office Action dated March 19, 2008. A Notice of Appeal and appropriate Request for Pre-Appeal Brief Review were filed with the Patent and Trademark Office on May 27, 2008.

In a communication dated July 3, 2008, it was indicated that the application should proceed to the Board of Appeals and Interferences. Accordingly, this Appeal Brief is being filed and the required fee of $510.00 pursuant to 37 C.F.R. §41.20(b)(2) should be deducted from Deposit Account No. 12-0913.

(i) Real Party In Interest

This application is assigned to Nortel Networks Limited, who is the real party in interest.

(ii) Related Appeals and Interferences

There are no appeals, interferences or judicial proceedings known to the appellant, the appellant's legal representatives or the assignee which may be related to,

directly affect or be directly affected by or have a bearing on the decision in the pending appeal.

(iii) Status of Claims

This application was filed with claims 1-58. After a first Office Action of December 20, 2005, claims 1-19 and 34-48 were cancelled. Therefore, claims 20-33 and 49-58 remain in the application, and have not been amended. Claims 28-29 have been objected to as containing allowable subject matter, and claims 20-27, 30-33 and 49-58 remain rejected. It is the rejection of claims 20-27, 30-33 and 49-58 that is appealed. Those claims, and objected to claims 28-29, are set forth in the appended Claims Appendix.

(iv) Status of Amendments

No amendment was filed subsequent to the final rejection of March 19, 2008.

(v) Summary of Claimed Subject Matter

Two independent claims are in the application, independent claims 20 and 49. Following is a concise explanation of the subject matter of these claims:

Independent Claim 20

This claim is directed to a method of providing a virtual private network (VPN) service through a shared network infrastructure *(reference 10 in Figs. 1-3 ; paragraph [0042])* comprising a plurality of interconnected provider edge (PE) devices *(reference 11 in Figs. 1-4 ; paragraph [0042])* having customer edge (CE) interfaces *(interfaces between the PE devices 11 and CE devices 12 in Figs. 1-3 ; reference 20 in FIG.4 ; paragraph [0044] ; paragraph [0045] first sentence)*, wherein some of the CE interfaces are allocated to a VPN *(references x and y in Figs 1-4 ; paragraph [0046] first sentence ; paragraph [0049])* supporting a plurality of virtual local area networks (VLANs) *(references 2,3,5,7,9 in Figs 1-4 ; paragraph [0051] first sentence ; paragraph [0052])* and are arranged for exchanging tagged data frames with CE devices respectively connected to the PE devices through said CE interfaces *(paragraph [0051])*, each tagged frame including a VLAN identifier (*Figs 1-4 ; paragraph [0008] ; paragraph [0053])*, the method comprising the following steps:

- receiving at least one tagged frame from a CE device at each CE interface allocated to said VPN *(references 30-31 in Fig.4 ; paragraph [0055])*, and learning

a correspondence between said CE interface and each VLAN identifier included in said at least one tagged frame *(reference 39 in Fig.4 ; paragraphs [0050] and [0055])*;

- detecting whether a pair of CE interfaces allocated to said VPN and belonging to two PE devices correspond to a common VLAN identifier *(reference 41 in Fig.4 ; paragraph [0056])*; and
- in response to such detection, establishing at least one virtual circuit in the shared network infrastructure between said two PE devices, for forwarding frames including said common VLAN identifier *(references 13x,13y,14x in Figs.1-3 and 13x1,13x2,13y1,13y2 in Fig.4 ; reference 37 in Fig.5 ; paragraph [0056])*.

Independent Claim 49

This claim is directed to a provider edge (PE) device *(reference 11 in Figs. 1-4 ; paragraph [0042])* for a shared network infrastructure *(reference 10 in Figs. 1-3 ; paragraph [0042])*, comprising:

- means for communicating with other PE devices *(reference 11 in Figs. 1-3 ; paragraph [0042])* through the shared network infrastructure;
- at least one local customer edge (CE) interface *(interface between a PE device 11 and CE devices 12 in Figs. 1-3 ; reference 20 in FIG.4 ; paragraph [0044] ; paragraph [0045] first sentence)*;
- configuration means for allocating at least one local CE interface to a virtual private network (VPN) *(paragraph [0046])* supporting a plurality of virtual local area networks (VLANs) *(references 2,3,5,7,9 in Figs 1-4 ; paragraph [0051] first sentence ; paragraph [0052])*, the allocated local CE interface being arranged for exchanging tagged data frames with a respective CE device *(paragraph [0051])*, each tagged frame including a VLAN identifier (*Figs 1-4 ; paragraph [0008] ; paragraph [0053])*;
- means for learning a correspondence between a first local CE interface allocated to said VPN and a first VLAN identifier included in at least one tagged frame received from a CE device at said first local CE interface *(reference 39 in Fig.4 ; reference T in Fig.5 ; paragraphs [0050] and [0055])*;

- means for identifying another PE device having a CE interface allocated to said VPN and having received a tagged frame including said first VLAN identifier *(reference 41 in Fig.4 ; reference T in Fig.5 ; paragraph [0056])*; and
- means for establishing a virtual circuit in the shared network infrastructure, for communicating frames including said first VLAN identifier with the identified PE device *(references 13x,13y,14x in Figs.1-3 and 13x1,13x2,13y1,13y2 in Fig.4 ; reference 37 in Fig.5 ; paragraph [0056])*.

(vi) Grounds of Rejection to be Reviewed on Appeal

There are two grounds of rejection to be reviewed in this appeal.

(1) Claims 21-25, 30, 31 and 49-54 have been rejected by the Examiner under 35 U.S.C. §103(a) as being unpatentable over Jain et al. (US 6,765,914) in view of Walker et al. (US 6,701,375) in view of Goodwin (US 2002/0124107).

(2) Claims 26, 27, 32, 33 and 55-58 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jain in view of Walker in view of Goodwin when further in view of Fotedar et al. (US 6,944,159).

(vii) Argument

Ground 1

The claims involved in this appeal have not been amended throughout the prosecution of this application, and remain as originally filed on January 22, 2002. As clearly explained in Applicants' many responses during the prosecution of this application, and as agreed by the Examiner in numbered section 16 on page 8 of the final Office Action of March 19, 2008, the following features are absent from Jain and Walker:

(i) establishing a virtual circuit in a shared network infrastructure, in response to the detection of whether a pair of customer edge (CE) interfaces allocated to said virtual private network (VPN) and belonging to two provider edge (PE) devices correspond to a common virtual local area network (VLAN) identifier (see the final two clauses of claim 20);

(ii) establishing a virtual circuit in a shared network infrastructure, for forwarding frames including said common VLAN identifier (see the final clause of claim 20).

Indeed, with respect to (i), in Jain, there is no need to detect whether a pair of host-switch interfaces belonging to two different switches would correspond to a common VLAN ID so as to establish a virtual circuit in the shared network infrastructure between two switches. On the contrary, as soon as the manual configuration step of Jain is completed, a packet sent by a sending host can be routed to a destination host based on the MAC address of the destination host. If the destination MAC address does not belong to a local switch port, the packet is forwarded to the switch's bus connecting port, then to the bus and it is retrieved by all other switches before being accepted by the destined switch based on the destination MAC address (steps 710, 730, 735, 740 and 750). As a result, Jain does not disclose establishing a connection, in response to a detection that is absent from its teaching.

Jain does not disclose (ii), either. Jain teaches only a connection, and not a virtual circuit in a shared network infrastructure.

Turning to Walker, Walker does not disclose (i), particularly since it does not teach detecting whether a pair of CE interfaces allocated to said VPN and belonging to two PE devices correspond to a common VLAN identifier (VLAN is a notion which is totally absent from Walker).

Walker does not disclose (ii), either, because the virtual circuit of Walker is not meant to forward frames including a common VLAN identifier (no VLAN identifier being used in Walker).

In the final Office Action, the Examiner argued, in section 16, that Jain and Walker were being argued separately. That is nonsense. Since Jain and Walker are missing both (i) and (ii), combination of their teachings necessarily is also missing (i) and (ii). *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981) and *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986) cited by the Examiner simply do not support the Examiner's position. If features (i) and (ii) are missing from both Jain and Walker, features (i) and (ii) cannot suddenly appear in their combination. Thus, the Examiner's arguments fail at the onset.

The Examiner also admits that neither Jain nor Walker disclose the feature of the first subparagraph of claim 20 of the present application : "learning a correspondence between said CE interface and each VLAN identifier included in said at least one tagged frame". The Examiner argues, however, that such feature is taught by Goodwin.

Turning now to Goodwin, Goodwin discloses an inter-switch VLAN advertisement protocol called VAP. According to this protocol, the VLAN membership databases stored on a switch may be synchronized with other switches in the network.

In this way, a distant endstation connected to a distant switch (e.g. the endstation B connected to the switch 186 in Fig.3) can have its VLAN membership 10 updated in the database of a local switch (e.g. the switch 182 in Fig.3), through advertisement between the switches (paragraph [0044]).

But, according to Goodwin, the distant switch connecting the distant endstation knows that this distant endstation belongs to VLAN 10, as it is contained in its database from the beginning (paragraph [0044] or paragraph [0049]). This provisioning may be entered manually, for instance.

Thus, the learning by Goodwin only relates to VLAN membership propagated over the backbone. But a switch always knows the VLAN membership of the endstations connected to it. In other words, no learning of VLAN membership of an endstation to its connecting switch is disclosed or suggested by Goodwin.

In contrast, the learning of the present invention relates to a correspondence between a CE interface (all the more allocated to a given VPN) which has received a tagged frame previously from a (local) CE device and a VLAN identifier included in said tagged frame. When transposed onto Fig.2 of Goodwin, this would mean that the learned correspondence would have to be, e.g., between the interface between the switch 156 and the endstation B and a VLAN identifier included in a tagged frame previously received from the endstation B by the switch 156. This is not disclosed or even suggested by Goodwin.

Thus, Goodwin does not teach the learning claimed in claim 20 of the present invention, which the Examiner has admitted is missing also from Jain and Walker. It simply is not present in the combined teachings of the references.

Furthermore, just like Jain and Walker, Goodwin also does not disclose the features (i) and (ii) mentioned above. Thus, at least three elements of Claim 20 are missing from the combination of Jain, Walker and Goodwin.

In conclusion, even when their teachings are combined, Jain, Walker and Goodwin do not disclose the subject matter of claim 20 of the present application. The same applies to Claim 49 for the same reasons. Claims 21-33 and 50-58 are submitted to be allowable, as well, particularly since they depend on Claim 20 or 49 directly or indirectly.

Ground 2

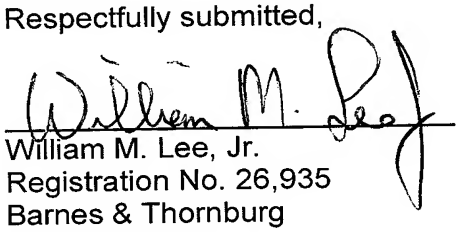
For the reasons explained above, since Fotedar adds nothing further and it is submitted that independent claims 20 and 49 are allowable, the rejections of Ground 2 also cannot stand.

CONCLUSION

The Examiner's rejection of the application has been demonstrated to be in error. The claims on appeal, which have not been amended since the filing of the application, define over the prior art and are submitted to be allowable thereover. Reversal of the Examiner is therefore in order, and is solicited.

July 22, 2008

Respectfully submitted,



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Claims Appendix

1 - 19. (cancelled)

20. A method of providing a virtual private network (VPN) service through a shared network infrastructure comprising a plurality of interconnected provider edge (PE) devices having customer edge (CE) interfaces, wherein some of the CE interfaces are allocated to a VPN supporting a plurality of virtual local area networks (VLANs) and are arranged for exchanging tagged data frames with CE devices respectively connected to the PE devices through said CE interfaces, each tagged frame including a VLAN identifier, the method comprising the following steps:

- receiving at least one tagged frame from a CE device at each CE interface allocated to said VPN, and learning a correspondence between said CE interface and each VLAN identifier included in said at least one tagged frame;
- detecting whether a pair of CE interfaces allocated to said VPN and belonging to two PE devices correspond to a common VLAN identifier; and
- in response to such detection, establishing at least one virtual circuit in the shared network infrastructure between said two PE devices, for forwarding frames including said common VLAN identifier.

21. A method as claimed in claim 20, further comprising the following steps:

- establishing a respective flooding virtual circuit in the shared network infrastructure between each pair of PE devices having at least one CE interface allocated to said VPN;
- in response to reception of a first tagged frame including a VLAN identifier at a first CE interface, allocated to said VPN, of a first PE device, propagating said first tagged frame on each flooding virtual circuit established from the first PE device; and
- in response to reception of the first tagged frame on a flooding virtual circuit at another PE device, propagating the first tagged frame to each CE interface, allocated to said VPN, of said other PE device.

22. A method as claimed in claim 21, wherein the correspondence between the first CE interface and the VLAN identifier is learnt in response to the reception of the first tagged frame including said VLAN identifier at the first CE interface.

23. A method as claimed in claim 21, further comprising the following steps in response to the reception of the first tagged frame including said VLAN identifier at the first CE interface:

- allocating, at the first PE device, a first virtual circuit resource for said VPN and the VLAN identifier included in the first tagged frame;
- transmitting a first signaling message from the first PE device to each other PE device of the shared network infrastructure having at least one CE interface allocated to said VPN, said first signaling message indicating the first virtual circuit resource and said VPN and VLAN identifier; and
- in response to reception of the first signaling message at each other PE device, storing an identification of the first virtual circuit resource in association with said VPN and VLAN identifier.

24. A method as claimed in claim 23, further comprising the following steps in response to reception of a second tagged frame including said VLAN identifier at a second CE interface, allocated to said VPN, of another PE device, whereby it is detected that the first and second CE interfaces both correspond to said VLAN identifier:

- allocating, at said other PE device, a second virtual circuit resource for said VPN and said VLAN identifier; and
- transmitting a second signaling message from said other PE device to the first PE device, thereby completing the establishment of a virtual circuit, defined by said first and second virtual circuit resource.

25. A method as claimed in claim 24, wherein frames pertaining to said VPN and including said VLAN identifier are forwarded from the first PE device to said other PE device by means of the second virtual circuit resource, and frames pertaining to said VPN and including said VLAN identifier are forwarded from said other PE device to the first PE device by means of the first virtual circuit resource.

26. A method as claimed in claim 24, wherein the first and second virtual circuit resources are labels of a multi-protocol label switching architecture of the shared network infrastructure.

27. A method as claimed in claim 26, wherein the first and second signaling messages are in accordance with a label distribution protocol supported by the multi-protocol label switching architecture.

28. A method as claimed in claim 24, further comprising the step of forwarding the second tagged frame to the first PE device by means of the first virtual circuit resource.

29. A method as claimed in claim 28, wherein said second tagged frame is forwarded by the first PE device through the first CE interface, identified as corresponding to the VLAN identifier for which the first virtual circuit resource has been allocated.

30. A method as claimed in claim 20, wherein the VPN has a topology such that at most two CE interfaces allocated thereto are allowed to receive tagged frames including a given VLAN identifier.

31. A method as claimed in claim 20, wherein the CE interfaces allocated to the VPN are Ethernet interfaces.

32. A method as claimed in claim 20, wherein said virtual circuits are label-switched paths of a multi-protocol label switching architecture of the shared network infrastructure.

33. A method as claimed in claim 32, wherein the step of establishing a virtual circuit between two PE devices comprises exchanging messages of a label distribution protocol supported by the multi-protocol label switching architecture between said two PE devices.

34. - 48. (cancelled)

49. A provider edge (PE) device for a shared network infrastructure, comprising:

- means for communicating with other PE devices through the shared network infrastructure;
- at least one local customer edge (CE) interface;
- configuration means for allocating at least one local CE interface to a virtual private network (VPN) supporting a plurality of virtual local area networks (VLANs), the allocated local CE interface being arranged for exchanging tagged data frames with a respective CE device, each tagged frame including a VLAN identifier;
- means for learning a correspondence between a first local CE interface allocated to said VPN and a first VLAN identifier included in at least one tagged frame received from a CE device at said first local CE interface;
- means for identifying another PE device having a CE interface allocated to said VPN and having received a tagged frame including said first VLAN identifier; and
- means for establishing a virtual circuit in the shared network infrastructure, for communicating frames including said first VLAN identifier with the identified PE device.

50. A device as claimed in claim 49, further comprising:
- means for establishing a respective flooding virtual circuit in the shared network infrastructure to each other PE device configured to have at least one CE interface allocated to said VPN; and
- means responsive to reception of a first tagged frame including the first VLAN identifier at the first local CE interface, for propagating said first tagged frame on each of the flooding virtual circuits established to said other PE devices.

51. A device as claimed in claim 50, further comprising:
- means responsive to reception, on a flooding virtual circuit from another PE device configured to have at least one CE interface allocated to said VPN, of a tagged frame including a VLAN identifier for which no CE interface has been learnt, for propagating said tagged frame through any local CE interface allocated to said VPN.

52. A device as claimed in claim 50, wherein the learning means are arranged to store the correspondence between the first local CE interface and the first VLAN

identifier in response to the reception of the first tagged frame at the first local CE interface.

53. A device as claimed in claim 50, further comprising:

- means for allocating a first virtual circuit resource for said VPN and first VLAN identifier in response to the reception of the first tagged frame at the first local CE interface;
- means for transmitting a first signaling message to each other PE device of the shared network infrastructure configured to have at least one CE interface allocated to said VPN, said first signaling message indicating the first virtual circuit resource and said VPN and first VLAN identifier.

54. A device as claimed in claim 53, wherein the means for identifying another PE device are responsive to reception from said other PE device of a second signaling message indicating a second virtual circuit resource, said VPN and first VLAN identifier, whereby frames including said first VLAN identifier and received at the first CE interface are forwarded to the identified PE device on a virtual circuit by means of the second virtual circuit resource.

55. A device as claimed in claim 54, wherein the first and second virtual circuit resources are labels of a multi-protocol label switching architecture of the shared network infrastructure.

56. A device as claimed in claim 55, wherein the first and second signaling messages are in accordance with a label distribution protocol supported by the multi-protocol label switching architecture.

57. A device as claimed in claim 49, wherein the VPN has a topology such that at most two CE interfaces allocated thereto are allowed to receive tagged frames including a given VLAN identifier.

58. A device as claimed in claim 49, wherein each CE interface allocated to said VPN is an Ethernet interface.

Evidence Appendix

None

Related Proceedings Appendix

None